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Artificial erythrocyte - comprises modified liposome of lipid membrane
contg. aq. soln. of haemoglobin and allosteric effector

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Patent Details:

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JP 4300838	A		7	A61K-037/14	

Abstract (Basic): JP 4300838 A

Artificial erythrocyte comprises liposome of lipid membrane
contg. aq. soln. of haemoglobin and allosteric effector. The liposome
is modified with a coagulation inhibitor hydrophobic terminal part
fixed with the membrane-surface hydrophylic part outside of the
liposome. The wt. ratio of lipid of liposome and hemoglobin is
0.40-1.67.

Pref. the allosteric effector is inositol hexaphosphate. The
hydrophobic part of the coagulation inhibitor is an alcohol with a long
chain fatty acid, sterol, or polyoxypropylene alkyl or phospholipid.
The hydrophilic polymer chain part is polyethylene glycol. The lipid
membrane contains vitamin E antioxidant.

In an example, an aq. soln. (108 g) of a powder mix of
phosphatidyl choline, cholesterol, myristic acid, and vitamin E (180g).
is stirred with inositol hexaphosphate (0.8 ml based on 1 ml of
Haemoglobin), and a haemoglobin soln. (600 ml) contg. 50 W/V of
haemoglobin, to form a soln. contg liposome with 220 nm average grain
size. Physiological saline soln. contg. 6 wt.% of hydroxy ethyl starch
is added to the soln. contg. to form a liposome suspension (120 ml).
Monomethoxy polyethylene glycol (PEG) (100g) is dissolved in
1,2-dichloroethane (500 ml) and reflux-treated with addn. of succinic
anhydride (10g) and pyridine (8ml). Obtd. reaction soln. is dissolved
in water (200 ml), cleaned with ether, and extd. with chloroform (200
ml). After evaporation, the soln. is dissolved in ethanol (400 ml),
purified with hexane, and dried to form PEG with one carboxy terminal.
The PEG (30g) hydrogenated phosphatidyl ethanol amine (7g),
dicyclohexyl carbodiimide (1,8g) are added to chloroform (50 ml) and
reacted at 50 deg.C overnight. Obtd. reaction product is purified to
obtain phospholipid. coagulation inhibitor. The inhibitor (5 wt.%
haemoglobin) is added to the liposome soln. and incubated at 37 deg.C
for 3 hrs. to form a haemoglobin-contg. liposome suspen

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Title Terms: ARTIFICIAL; ERYTHROCYTE; COMPRISE; MODIFIED; LIPOSOME ; LIPID
; MEMBRANE; CONTAIN; AQUEOUS; SOLUTION; HAEMOGLOBIN; EFFECTOR

Derwent Class: A96; B04; B05

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